

What is claimed is:

1 1. An optical disc comprising:

2 a data area in which a data pit string corresponding  
3 to recorded digital data is formed, the data pit string including  
4 concave parts, convex parts, and a certification pit, the  
5 certification pit certifying that the recorded digital data  
6 is original,

7 wherein a length of each of the concave parts and convex  
8 parts satisfies a predetermined rule, and

9 a length of the certification pit does not satisfy  
10 the predetermined rule.

1 2. The optical disc of Claim 1,

2 wherein the predetermined rule is based on a run length  
3 limitation method that encodes the digital data so that a zero  
4 bit sequence is obtained, a total number of zero bits in the  
5 zero bit sequence being within a range from a first number  
6 of zero bits to a second number of zero bits,

7 the length of each of the concave parts and convex  
8 parts is within a range from a first length to a second length,  
9 the first length and the second length respectively

10 corresponding to the first number and the second number, and

11 the certification pit is a concave part or a convex  
12 part, the length of the concave part or the convex part being  
13 less than the first length.

1 3. The optical disc of Claim 2,  
2 wherein the run length limitation method is an 8-16  
3 modulation method that encodes the digital data by replacing  
4 each set of 8 bits of the digital data with a data piece of  
5 16 bits.

1 4. The optical disc of Claim 3 further comprising:  
2 a specific area that records information showing a  
3 location and a length of the certification pit.

1 5. The optical disc of Claim 1,  
2 wherein the predetermined rule is based on a run length  
3 limitation method that encodes the digital data so that a zero  
4 bit sequence is obtained, a total number of zero bits in the  
5 zero bit sequence being within a range from a first number  
6 to a second number,  
7 the length of each of the concave parts and convex  
8 parts is within a range from a first length to a second length,  
9 the first length and the second length respectively  
10 corresponding to the first number and the second number, and  
11 the certification pit is a concave part, the length  
12 of the concave part exceeding the second length.

1 6. The optical disc of Claim 5,  
2 wherein the run length limitation method is an 8-16

3 modulation method that encodes the digital data by replacing  
4 each set of 8 bits of the digital data with a data piece of  
5 16 bits.

1 7. The optical disc of Claim 6 further comprising:  
2 a specific area that records information showing a  
3 location and a length of the certification pit.

1 8. The optical disc of Claim 1,  
2 wherein the predetermined rule is based on a run length  
3 limitation method that encodes the digital data so that a zero  
4 bit sequence is obtained, a total number of zero bits in the  
5 zero bit sequence being within a range from a first number  
6 to a second number,

7 the length of each of the concave parts and convex  
8 parts is within a range from a first length to a second length,  
9 the first length and the second length respectively  
10 corresponding to the first number and the second number, the  
11 concave parts and convex parts being coated with a reflection  
12 layer, and

13 the length of the certification pit exceeds the second  
14 length and the certification pit includes a concave part and  
15 an uncoated convex part from which the reflection layer is  
16 removed.

1 9. The optical disc of Claim 1,

2 wherein the predetermined rule is based on a run length  
3 limitation method that encodes the digital data so that a zero  
4 bit sequence is obtained, a total number of zero bits in the  
5 zero bit sequence being within a range from a first number  
6 to a second number,

7 each of the concave parts and convex parts is coated  
8 with a first reflection material, and

9 the certification pit is covered with a second reflection  
10 material, a reflection factor of the second reflection material  
11 being lower than a reflection factor of the first reflection  
12 material.

1 10. An optical disc comprising:

2 a processed area that has been processed with a laser,  
3 wherein an area of the optical disc other than the  
4 processed area includes concave parts and convex parts, each  
5 of which has a length within a range from a first length to  
6 a second length and is coated with a reflection layer, and

7 the processed area includes a first concave part or  
8 a first pit string, the first concave part having a length  
9 exceeding the second length, and the first pit string having  
10 a length exceeding the second length and including concave  
11 parts and uncoated convex parts from which the reflection layer  
12 is removed.

1 11. The optical disc of Claim 10 further comprising a specific

2 area,

3 wherein the processed area further includes a second  
4 pit string that has a length exceeding the second length and  
5 includes a convex part on which a reflection layer having a  
6 length less than the first length exists,

7 the first concave part or the first pit string is  
8 distinguished from the second pit string by comparing a level  
9 of an RF signal obtained from the processed area with a first  
10 threshold value and a second threshold value, and

11 the specific area records information showing a location  
12 and a length of the first concave part or the first pit string.

1 12. The optical disc of Claim 11,

2 wherein an RF signal obtained from the second pit string  
3 has a level that remains above the first threshold value but  
4 below the second threshold value, and

5 an RF signal obtained from the first concave part or  
6 the first pit string has a level that remains below both of  
7 the first threshold value and the second threshold value,

8 wherein the first threshold value is obtained by  
9 subtracting a predetermined offset from a certain threshold  
10 value used to convert an RF signal into a binary signal, and

11 the second threshold value is obtained by adding the  
12 predetermined offset to the certain threshold value.

1 13. A reproduction apparatus that reproduces an optical disc,

2 comprising:

3 a signal reproduction means for generating an RF signal  
4 by reading a pit string on the optical disc using laser light;

5 a first binary signal generating means for converting  
6 the RF signal into a first binary signal using a first threshold  
7 value, the first binary signal including a plurality of high  
8 sections and a plurality of low sections, each high section  
9 corresponding to a convex part having a length within a range  
10 from a first length to a second length or a certification convex  
11 part having a length less than the first length;

12 a second binary signal generating means for converting  
13 the RF signal into a second binary signal using a second threshold  
14 value, the second binary signal including a plurality of high  
15 sections and a plurality of low sections, each high section  
16 corresponding to a convex part having a length within the range  
17 from the first length to the second length;

18 an EX-OR calculation means for calculating an exclusive  
19 OR of the first binary signal and the second binary signal;  
20 and

21 a judging means for judging, according to the calculated  
22 exclusive OR, whether certification convex parts exist on the  
23 optical disc with a predetermined distance therebetween.

1 14. A reproduction apparatus that reproduces an optical disc,  
2 comprising:

3 a signal reproduction means for generating an RF signal

4 by reading a pit string on the optical disc using laser light;

5 a first binary signal generating means for converting  
6 the RF signal into a first binary signal using a first threshold  
7 value, the first binary signal including a plurality of high  
8 sections and a plurality of low sections, each high section  
9 corresponding to a convex part having a length within a range  
10 from a first length to a second length or a certification convex  
11 part having a length less than the first length;

12 a second binary signal generating means for converting  
13 the RF signal into a second binary signal using a second threshold  
14 value, the second binary signal including a plurality of high  
15 sections and a plurality of low sections, each low section  
16 corresponding to a concave part having a length within the  
17 range from the first length to the second length or a  
18 certification concave part having a length less than the first  
19 length;

20 an EX-OR calculation means for calculating an exclusive  
21 OR of the first binary signal and the second binary signal;  
22 and

23 a judging means for judging, according to the calculated  
24 exclusive OR, whether the certification convex part and the  
25 certification concave part exist on the optical disc with a  
26 predetermined distance therebetween.

1 15. A reproduction apparatus that reproduces an optical disc,  
2 a pit string including concave parts and convex parts being

3 formed on the optical disc, each of the concave parts and convex  
4 parts being coated with a reflection layer and having a length  
5 within a range from a first length to a second length,

6 the reproduction apparatus comprising:

7 a signal reproduction means for generating an RF signal  
8 by reading a pit string on the optical disc using laser light;

9 a judging means for judging whether (1) a concave part  
10 having a third length or (2) a pit string having the third  
11 length and including an uncoated convex part from which the  
12 reflection layer is removed exists on the optical disc, by  
13 checking a length of each low section of the RF signal; and

14 a determining means for determining that the optical  
15 disc is original if a judgement result by the judging means  
16 is affirmative.

1 16. A disc identifier selecting apparatus that selects a pit  
2 string formed on an optical disc as a disc identifier, comprising:

3 a signal reproduction means for generating an RF signal  
4 by reading a pit string on the optical disc using laser light,  
5 the RF signal including a first peak and a second peak, the  
6 first peak corresponding to a convex part having a length within  
7 a range from a first length to a second length, the second  
8 peak corresponding to a convex part having a length less than  
9 the first length;

10 a first binary signal generating means for converting  
11 the RF signal into a first binary signal using a first threshold



12 value, the first binary signal including a plurality of high  
13 sections and a plurality of low sections, the first threshold  
14 value being lower than a level of the second peak;

15 a second binary signal generating means for converting  
16 the RF signal into a second binary signal using a second threshold  
17 value, the second binary signal including a plurality of high  
18 sections and a plurality of low sections, the second threshold  
19 value being lower than a level of the first peak and higher  
20 than the level of the second peak; and

21 a selecting means for selecting a pit string as the  
22 disc identifier by judging whether a difference in length between  
23 a low section of the first binary signal and a low section  
24 of the second binary signal exceeds a predetermined length.

1 17. The disc identifier selecting apparatus of Claim 16,

2 wherein the first binary signal includes a low section  
3 corresponding to a concave part sandwiched between convex parts,  
4 each of which has a length within the range from the first  
5 length to the second length, and

6 the second binary signal includes a low section  
7 corresponding to a concave part sandwiched between convex parts,  
8 each of which has a length less than the first length.